



Case Study: Grounding of the MONCHEGORSK, Bridge Team Management, and Passage Planning.

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Case Study: Grounding of the MONCHEGORSK, September 5, 1998



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Picture courtesy of Betsy J. Cammon

Picture of MONCHEGORSK aground at Amsterdam Bay, Anderson Island, Washington.

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Some general characteristics of the MONCHEGORSK.

Length: 177 meters (581 feet)

Beam: 23 meters (74 feet)

Draft: 6.5 meters forward; 8 meters aft

Deadweight: 19,943 tons

Gross Tons: 18,627 tons

Year Built: 1983

Main Engine: 15,446 kW (20,999 bhp)

General Cargo Ship with Ro/Ro side ramp and icebreaking capability. Single screw, CPP, geared to two main engines.

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Maneuvering Characteristics

Crash Stop (Maneuvering Full Astern both Engines)

From Full Ahead

Ballast: 0.55 NM Loaded: 0.85 NM
Time: 3 minutes 10 seconds

From Slow Ahead

Ballast: 0.35 NM Loaded: 0.5 NM
Time: 2 minutes 30 seconds

- The MONCHEGORSK was in an partially loaded condition with a draft of 6.5 meters forward and 7.95 meters aft.
- Loaded the ship draws 8.5 meters.
- The ship was carrying 52 containers, 2 vehicles, and 10 break bulk cargoes on this voyage.
- The ship's capacity is 140 cars, 36 trailers, and 576 containers (TEU).

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Maneuvering Characteristics

Turning Circles

Full Ahead

Ballast	Advance: 0.31 NM	Transfer: 0.16 NM
Loaded	Advance: 0.29 NM	Transfer: 0.15 NM

Slow Ahead

Ballast	Advance: 0.27 NM	Transfer: 0.14 NM
Loaded	Advance: 0.25 NM	Transfer: 0.14 NM

- Turning circle information needs to be considered based on partial load and intermediate speed 9 to 11 knots.
- “Full Ahead,” both engines on line, with a pitch setting of “10,” and 540 rpm is listed on the maneuvering diagram as 18.1 knots.
- “Slow Ahead,” both engines on line, with a pitch setting of “4,” and 420 rpm is listed on the maneuvering diagram as 11.4 knots.
- These reflect a loaded condition.
- Note on the maneuvering diagram indicates 1 to 3 knots of additional speed for a ballast condition.

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Bridge of the MONCHEGORSK looking from amidships station to starboard side. Note radar behind curtain and white phone in foreground at left. Chief Officer reported trying to use this phone to call the master before the grounding. Picture taken when MONCHEGORSK returned to Olympia, Washington about a month and a half after the grounding.

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View looking forward from MONCHEGORSK's bridge at the starboard control station. Picture taken when MONCHEGORSK returned to Olympia, Washington about a month and a half after the grounding.

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View of the port side of MONCHEGORSK's bridge taken from just left of the center control station. Note the gyro repeater mounted on stanchion between forward windows. The pilot was stationed at the port windows in the minutes preceding the grounding. Picture taken when MONCHEGORSK returned to Olympia, Washington about a month and a half after the grounding.

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Looking forward through port bridge windows from control station. Pilot was stationed in this window in the minutes preceding the grounding. Picture taken when MONCHEGORSK returned to Olympia, Washington about a month and a half after the grounding.

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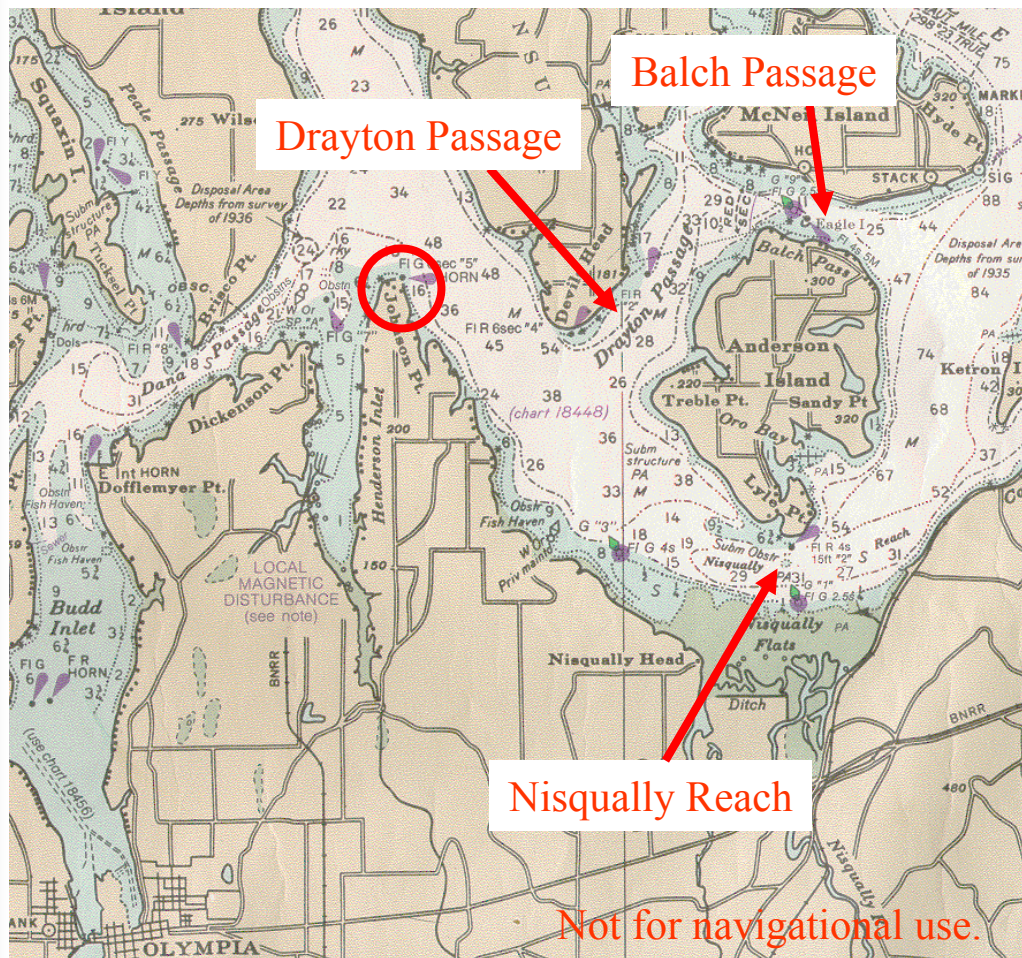




General map of western Washington State. The grounding location is located near the southern terminus of Puget Sound (south of Tacoma).

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Nautical chart of the area transited outbound from Olympia, Washington (lower left) by the MONCHEGORSK prior to the grounding.

The turn at Johnson Point (circled) was useful in adjusting course recorder trace to the correct time.

Note the Nisqually Flats which is a National Wildlife Refuge. Balch Passage, between McNeil and Anderson Islands, was the path the Pilot intended to take from the start of the transit.

Nisqually Reach, south of Anderson Island, was the track the Master understood the vessel would follow.



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Grounding Location:
Amsterdam Bay, Anderson
Island, Washington. Aerial
photo taken in 1992 looking
from head of Amsterdam
Bay to the west. Note the
sand spit across the entrance
to the bay.

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Grounding Location: Aerial photo looking east towards Anderson Island, just south of the entrance to Amsterdam Bay. Photos of the MONCHEGORSK approaching the bay prior to grounding were taken from the group of homes to the lower right of the picture.

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Eagle Island in Balch Passage, view looking west. The Pilot intended to transit Balch Passage, and would have passed to the right (north) of Eagle Island had the MONCHEGORSK not grounded in Drayton Passage, the northern extent of which can just be seen in the photo at upper center.

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Brief profile of those on the MONCHEGORSK's bridge when the ship grounded at the entrance to Amsterdam Bay.

The Pilot: Master 1600 gross tons, Second Mate any gross tons, Oceans. First Class Pilot any tons, Puget Sound. Sixteen years experience as pilot. No other incidents.

The Master: Master's license (Russia). Reported working as a pilot in Murmansk for five years. Worked aboard MONCHEGORSK before. Russian was first language, scored well on English language proficiency test. No interpreter necessary.

The Chief Officer: Master's license (Russia). Worked aboard MONCHEGORSK before. Russian as first language, scored well on English language proficiency test. No interpreter necessary.

The Helmsman: Able-Bodied Seaman. Worked aboard MONCHEGORSK before. Russian was first language. Required an interpreter for interview.



Devil's Head

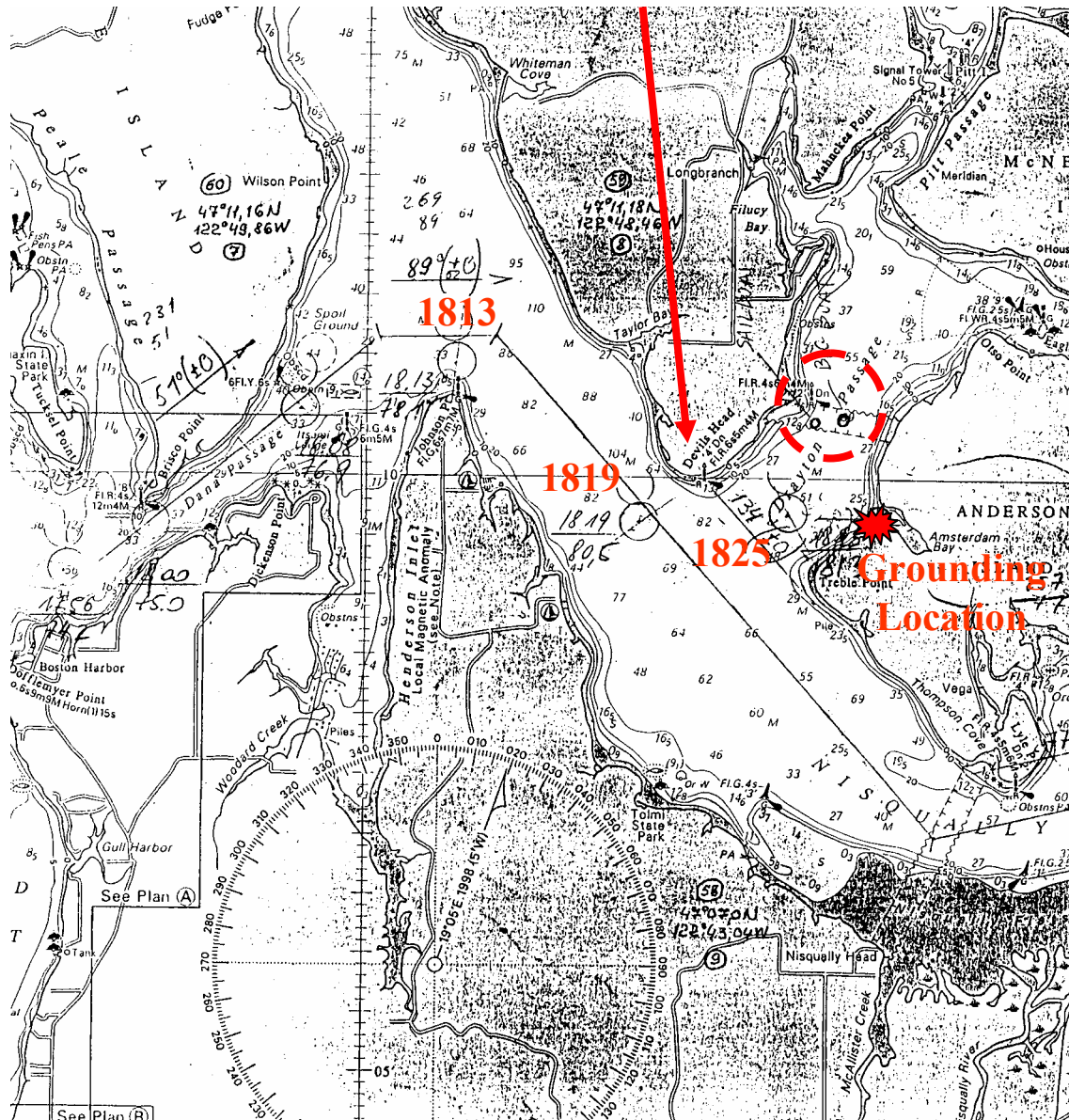


Chart copy from
MONCHEGORSK
showing trackline laid
down and fixes taken
by the Chief Officer.

Note the departure
from the intended route
at Devil's Head, the
last fix in Drayton
Passage at 1825, and
the ship's eventual
grounded position on
the west side of
Anderson Island
(Amsterdam Bay).
Also noted are the
positions of small
vessels (in circle)
indicated by the Chief
Officer for the USCG.

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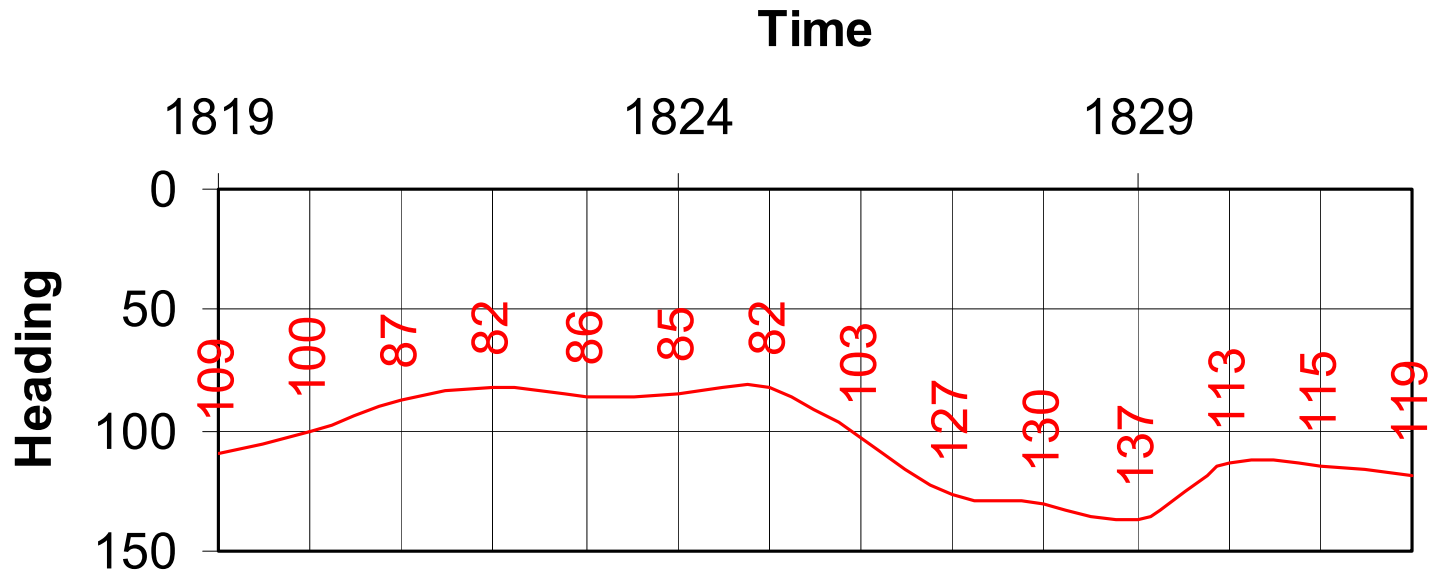


Raw Heading	Corrected Heading (+32 degrees)	Raw Time	1737 Start (as annotated)	1739 Start (+2 minutes)	1740 Start (+3 minutes)	1743 Start (+6 minutes)	Action
50	82	1356	1822	1824	1825	1828	Begin starboard turn
71	103	1357	1823	1825	1826	1829	
95	127	1358	1824	1826	1827	1830	
98	130	1359	1825	1827	1828	1831	
105	137	1400	1826	1828	1829	1832	Begin port turn
81	113	1401	1827	1829	1830	1833	Begin starboard turn
83	115	1402	1828	1830	1831	1834	
87	119	1403	1829	1831	1832	1835	Steady up

Course recorder information had to be adjusted for both course and time because the Chief Officer did not start it before the MONCHEGORSK departed the dock. He annotated the time as 1737. Using the ship's position as recorded by the Chief Officer on the chart, an additional correction of 2 to 3 minutes was found to be necessary. A suggested 6-minute adjustment was checked but did not correlate well with other data. The 32 degree course correction was derived from the recorded heading versus the observed grounded heading.



**Corrected Heading (+32 degrees)
Corrected Time (+3 minutes)**



Plot of the MONCHEGORSK's heading versus time after the ship began its turn to port around Devil's Head. Note start of turn to right at 1825, the slowing of the turn at 1827, and the maximum heading of 137 degrees at 1829. Grounding time was estimated to be 1830.



Raw Time (UTC)	Time (Local) (UTC-7)	Engine Pitch Ordered	Engine Pitch Response	Port Engine R.P.M.	Starboard Engine R.P.M.	Action
23.57:45 (5 Sept)	16.57:45 (5 Sept)	0	-1	455	461	Stopped
00.03:21 (6 Sept)	17.03:21	-2	-2	457	461	Astern
00.04:28	17.04:28	0	0	456	465	Stopped
00.06:27	17.06:27	+ 2	+ 1	452	453	Ahead
00.10:33	17.10:33	0	0	459	467	Stopped
00.15:30	17.15:30	+ 2	+ 1	450	455	Ahead
01.01:04	18.01:04	+ 5	+ 7	455	462	Max. Ahead
01.20:48	18.20:48	+ 4	+ 6	480	487	Begin to Slow
01.26:13	18.26:13	-2	-3	467	474	Astern
01.26:29	18.26:29	-5	-8	459	465	Max. Astern
01.27:11	18.27:11	0	-3	476	484	Stopped
01.27:17	18.27:17	+ 1	0	473	477	Ahead
01.27:49	18.27:49	+ 5	+ 6	447	453	Max. Ahead
01.28:09	18.28:09	0	0	472	480	Stopped
01.28:19	18.28:19	-4	-5	466	470	Astern
01.29:02	18.29:02	+ 4	-4	475	483	Ahead
01.29:15	18.29:15	-5	-6	464	471	Astern
01.29:23	18.29:23	-5	-8	464	470	Max. Astern
02.00:02	19.00:02	0	0	469	475	Stopped

Extract from the bell logger tape. Note the slowing of the MONCHEGORSK's engines starting at 1820 as the ship rounded Devil's Head. Note also the one-minute backing bell at 1826.

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MONCHEGORSK approaching Amsterdam Bay on September 5, 1998. View is from homeowner's property south of the Bay entrance looking approximately north. Small power boat can be discerned behind the ship (circled). Aboard that boat was one of the witnesses to the grounding. Note the point north of Amsterdam Bay entrance in the right of the photo.

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MONCHEGORSK approaching Amsterdam Bay on September 5, 1998.
View is from homeowner's property south of the Bay entrance looking
approximately north.

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MONCHEGORSK approaching Amsterdam Bay on September 5, 1998. View is from homeowner's property south of the Bay entrance looking approximately north. Small power boat can again be discerned behind the ship (circled). Note white water in ship's wake--indicating the ship is backing at this point.

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MONCHEGORSK entering Amsterdam Bay on September 5, 1998.
View is from homeowner's property south of the Bay entrance looking
approximately north.

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MONCHEGORSK aground in Amsterdam Bay on September 5, 1998. View is from homeowner's property south of the Bay. Starboard anchor chain can be seen leading to the water. Note small group of local residence to right in the photo.

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Picture courtesy of Betsy J. Cammon

Picture of MONCHEGORSK aground at Amsterdam Bay taken later in the evening. At this time the tug SEA CLOUD is made up to the stern of the MONCHEGORSK by a tow wire and is pulling.

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Error Chain Indicators

Some of the error chain indicators from Captain A.J. Swift's "Bridge Team Management: A Practical Guide" that were present as the MONCHEGORSK grounding played-out.

- **Ambiguity.** The track to be followed by the MONCHEGORSK was not clear to all members of the bridge team prior to departure.
- **Distraction.** The Pilot stated that he was concerned with small vessel traffic.
- **Inadequacy and Confusion [loss of control].** The Pilot said he knew the heading had gotten too far over and realized he needed to come hard to port or stop the vessel. The Helmsman stated he knew the ship had to proceed more to port, but he received starboard helm orders. The Chief Mate said he wondered about the Pilot's starboard turn order, and attempted to contact the Master regarding the order.
- **Communication Breakdown.** The Chief Mate did not call the Master upon learning of the Pilot's intent to deviate from the intended route. The Chief Mate was apparently unaware of the Pilot's concern for small vessel traffic in Drayton Passage.
- **Non Compliance with Plan.** The planned route was not followed.
- **Procedural Violation.** The Chief Mate did not call the Master about the deviation from the intended route despite a standing order to the contrary.

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Lessons-Learned

- **Passage plans should be reviewed and discussed by the bridge team (including the pilot) when the pilot boards the ship. Any changes foreseen at that time should be evaluated, plotted on the chart, and made known to all bridge team members.**
- **Changes to passage plans should be evaluated to determine their impact on the composition and duties of the bridge team.**
- **Communication is critical to the bridge team. It maintains the situational awareness of bridge team members and ensures that developing error chains are interrupted.**
- **Standing orders should be consistently followed.**

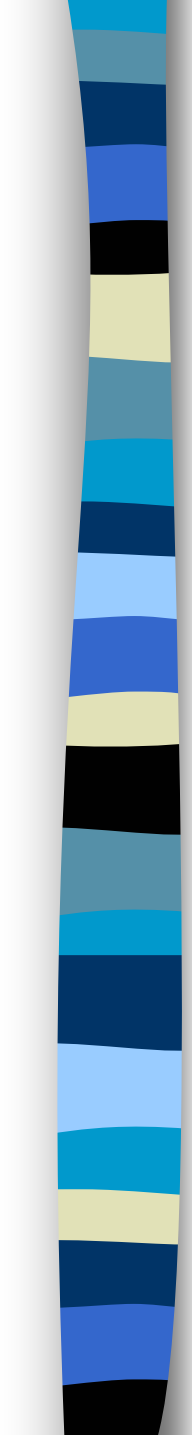


Investigation Notes

- **Multiple investigating agencies: Pilotage Commission, Ecology and U.S. Coast Guard**
- **Sorting out timing of events from recorded information – course recorder, engine logger interpretation.**
- **Differing recollections of apparently credible individuals – the Chief Officer and Pilot offered differing accounts of the who gave the various engine orders that were recorded.**
- **Interview timeliness. Some witnesses interviewed a month after the grounding.**
 - **Willingness of interviewees. Pilot reluctance to give statement to U.S. Coast Guard during initial investigation.**
- **Alcohol testing was not conducted due to equipment problems. Alcohol could not be ruled out categorically as a factor.**
- **Voyage Data Recorders – should help sort out events during future incidents once the requirement is implemented internationally.**
- **Fatigue – The Chief Officer offered a question to US Coast Guard investigators that raised the possibility that he may have been fatigued at the time of the grounding.**

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The Washington State Board of Pilotage Commissioners issued a reprimand to the pilot for his role in the grounding. In addition, the Board required him to take additional Bridge Resource Management training (at his own expense) and levied a monetary fine. An additional fine and suspension of his license were issued as a suspended sanction for a period of one year.

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The Washington State Department of Ecology publication
“Prevention Bulletin 99-02: The MONCHEGORSK”
[Publication #: 99-261] can be found at:
<http://www.ecy.wa.gov/pubs/99261.pdf>

or

contact Michael Lynch

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